

21 July 2002 Mission Report

Forecast:

The forecast for today calls for the earliest convective development along the west coast. Deeper easterly flow should put most of the intense convective activity along the west coast today. The forecast calls for drier air and advection of east coast anvils over the western part of the state, however, possibly suppressing west coast convection until later in the afternoon.

Summary:

Convective activity blew up near Naples and Ft. Myers around 1730Z and over land parallel to the east coast around 1930Z. Anvils streamed off to the SW and slightly south of the western ground site. This was an excellent opportunity for the aircraft to sample the entire lifecycle of the convectively generated anvils. The ER-2 did not fly because of ongoing repairs on the flap system.

Aircraft Reports:

Citation

The Citation started off flying two legs (one at 25 kft and one at 27 kft) near an anvil base and northwest of the western ground site. They then executed a spiral ascent from 27 to 35 kft, which got them out of the anvil layer (although there were still clouds above). They were then oriented by N-POL onto NE-SW oriented legs coordinated with the other aircraft. They flew multiple legs, moving down at altitudes of 35, 33, and 31 kft (the last leg was at about the base of the anvil). They then continued those legs, stepping back up to 35 kft. The cirrus anvil was dying out by the end of this procession, so they got a pretty good sampling of the entire lifetime of the anvil. This anvil was observed to have a downward sloping base to the east, but probably a top at a fairly uniform altitude. They finally aligned for the intercomparison with the WB-57F and got to their waypoint in thick, optically uniform cloud. They then returned to base.

Twin Otter

The Twin Otter had a single flight today, with a take-off at 1713Z. They flew out at 2 kft in order to conduct some particle sampling on a track north toward Naples. West of the western ground site, they carried out a spiral ascent from 100 ft to 10 kft, getting into low cloud layers a couple of times. They then flew several legs at various altitudes, sampling the convective region inflow on the west side of the cell in the Naples area. One notable observation during this period was an enhanced layer of particles between 4 and 8 kft (possibly Saharan dust). The end of the flight involved some legs flown under the anvils generated from the convection, which could provide some useful radiation measurements. The Twin Otter returned to base at 2135Z.

Proteus

The Proteus took off just after the WB-57F and flew the same flight track as the other aircraft at cruise altitude.

WB-57F

The WB-57F take-off was at 1802Z. During their initial ascent, they flew to 51 kft. The tropopause was at 48.6 kft (cold point at 49.8 kft). They flew several descending legs west of Naples and over the Gulf, getting good read-outs on the CAPS instrument, indicating clouds. During these legs, they saw their own contrail above them on several occasions. On one leg, they got into a cloud with a top at 46 kft and flew at 45 kft before being redirected by N-POL. They attempted to fly at 39 kft to coordinate with the Citation at that altitude, but were directed by Air Traffic Control to remain at 41 kft. They were still well-aligned with the Citation during this leg, and got good clouds at this altitude. They finally executed a climb to max altitude at 58 kft and did a box maneuver before returning home at 2343Z.

P-3

The P-3 took off at 1656Z. They flew in coordination with the other aircraft from 1740Z to 1930Z, studying the full anvil life cycle described in the Citation and WB-57F summaries. From 1938Z to 2050Z, they studied another intense convective cell north of Ft. Myers. From 2144Z to 2216Z they underflew the Citation/WB-57F coordinated line. The aircraft landed at 2317Z.